

WHAT IS CLAIMED IS:

1. A method for measuring distance comprising:

a first step to create a delay profile from the signal wave received from a signal transmitting station;

5 a second step to detect the startup timing of the delay profile as reference timing; and

a third step to detect the timing delayed by a predetermined value behind the reference timing as the receive timing for the signal wave;

10 wherein the distance between the signal transmitting station and signal receiving station is measured from the difference between the transmitting timing of said signal transmitting station and the receive timing.

2.A distance measuring method set forth in claim 1,
15 said second step further comprising:

a fourth step to calculate the first threshold value for distinguishing the incoming signal wave from noise in the delay profile;

20 a fifth step to detect the earliest receive timing as the first threshold value timing in the delay profile, among all the timing that a correlation value becomes equal to the first threshold value;

a sixth step to calculate the second threshold value for identifying the startup timing of said delay profile;
25 and

a seventh step to detect the earliest and closest receive timing relative to the first threshold value timing as the reference timing in the delay profile, among all the timing that a correlation value becomes equal to the
5 second threshold value.

3. A position measuring method comprising:

a first step for creating independent delay profiles from the signal waves received from at least three signal transmitting stations; and

10 a second step for detecting the startup timing of each said delay profile as reference timing;

wherein the time difference between the reference timing of each delay profile and receive timing of signal transmitting stations corresponding to said delay profile are calculated, and the positions of said signal receiving
15 station are measured from the relative differential timing thereof.

4. A position measuring method set forth in Claim 3, said second step further comprising:

20 a third step to calculate the first threshold value for distinguishing said incoming signal wave from noise in each delay profile;

a fourth step to detect the earliest receiving timing as the first threshold value timing, in each delay profile,
25 among all the timing that a correlation value becomes equal

to the first threshold value;

a fifth step calculate the second threshold value for identifying the startup timing of each said delay profile; and

5 a sixth step to detect the earliest and closest receive timing relative to the first threshold value timing as the reference timing in the delay profile, among all the timing that a correlation value becomes equal to the second threshold value.

10 5. An equipment for measuring distance using the wave signal received from a signal transmitting station comprising:

a means for creating a delay profile from the signal wave received from said signal transmitting station;

15 a means for calculating the startup timing of said delay profile as reference timing;

a means for calculating the timing delayed by a predetermined value behind the reference timing as the receive timing for the signal wave; and

20 a means for measuring distance from the difference between the transmitting timing of said signal transmitting station and the receive timing

6. An equipment set forth in Claim 5, the reference timing calculation means further comprising:

25 a means for calculating the first threshold value for

distinguishing the incoming signal wave from noise in the delay profile;

a means for detecting the earliest receive timing as the first threshold value timing in the delay profile, among all the timing that a correlation value becomes equal to the first threshold value;

a means for calculating the second threshold value for identifying the startup timing of the delay profile; and

a means for detecting the earliest and closest receive timing relative to said first threshold value timing as said reference timing in the delay profile, among all the timing that a correlation value becomes equal to the second threshold value.

7. An equipment for measuring positions using the wave signals received from signal transmitting stations comprising:

a means for creating independent delay profiles from the signal waves received from at least three signal transmitting stations;

a means for calculating the startup timing of each delay profile as reference timing; and

a means for calculating the time difference between the reference timing of each delay profile and receive timing of signal transmitting stations corresponding to said delay profile, and measuring the positions of said

signal receiving station from the relative differential timing thereof.

8. An equipment set forth in Claim 7, said reference timing calculation means comprising:

5 a means for calculating the first threshold value for distinguishing the incoming signal wave from noise in each delay profile;

10 a means for calculating the earliest receive timing as the first threshold value timing in each delay profile, among all the timing that a correlation value becomes equal to the first threshold value;

 a means for calculating the second threshold value for identifying the startup timing of each delay profile; and

15 a means for detecting the earliest and closest receive timing relative to the first threshold value timing as the reference timing in each delay profile, among all the timing that a correlation value becomes equal to the second threshold value.

20 9. Terminal equipment for receiving spread spectrum signals and measuring distances using these signals comprising:

 a means for receiving the spread spectrum signal required for distance measurement, and creating a signal from the received signal;

25 a means for generating the same spread spectrum signal

as that transmitted from the spread spectrum signal transmitting station, and creating a delay profile for calculating the correlation value between the spread spectrum signal and the received signal mentioned above;

5 a means for holding the output of the delay profile creating means;

 a means for calculating the first threshold value;

 a means for detecting the earliest receive timing in which the correlation value becomes equal to the first
10 threshold value;

 a means for calculating the second threshold value;

 a means for detecting the second reference receive timing from the second threshold value, delay profile, and first reference receive timing; and

15 a means for calculating the receive timing of the signal from the second reference receive timing.

10. A terminal equipment for receiving spread spectrum signals and measuring positions using these signals comprising:

20 a means for receiving the spread spectrum signal required for position measurement, and creating a signal from the received signal;

 a means for generating the same spread spectrum signal as that transmitted from the spread spectrum signal
25 transmitting station, and creating a delay profile for

calculating the correlation value between said spread spectrum signal and the received signal;

a means for holding the output of said delay profile creating means;

5 a means for calculating the first threshold value;

a means for detecting the earliest receive timing in which the correlation value becomes equal to the first threshold value;

a means for calculating the second threshold value;

10 and

a means for calculating the second reference receive timing from said second threshold value, delay profile, and first reference receive timing.

11. A terminal equipment set forth in Claim 10
15 comprises a means for calculating the signal receive timing from said second reference receive timing.

12. A terminal equipment set forth in either Claim 9, 10, and 11, wherein said reference timing calculation section selects the earliest and closest receive timing
20 relative to the first threshold value timing as the reference timing, among all the timing that the correlation value becomes equal to the second threshold value.

13. A terminal equipment set forth in Claim 12, wherein said receive timing calculation section detects the
25 receive timing delayed by a predetermined value behind the

reference timing as the receive timing for the signal wave.

14. A terminal equipment set forth in either Claim 9, 10, and 11, wherein said calculation section for the first threshold value detects, as the first threshold value, the value obtained by multiplying the greatest of all the correlation values by a predetermined coefficient.

15. A terminal equipment set forth in either Claim 9, 10, and 11 wherein said calculation section for the first threshold value measures the noise power value of the received signal and detects, as the first threshold value, the value obtained by multiplying said noise power value by a predetermined coefficient.

16. A terminal equipment set forth in either Claim 9, 10, and 11 wherein said calculation section for the first threshold value measures, as the first available value, the value obtained by multiplying the greatest of all the correlation values by a predetermined coefficient, and the noise power value of the received signal, then calculates, as the second available value, the value obtained by multiplying said noise power value by a predetermined coefficient, and detects said first or second available value, whichever is the greater, as the first threshold value.

17. A terminal equipment set forth in either Claim 9, 10, and 11 wherein said calculation section for the first

threshold value measures, as the first available value,
the value obtained by multiplying the greatest of all said
correlation values by a predetermined coefficient, and the
noise power value of the received signal mentioned above,
5 then calculates, as the second available value, the value
obtained by multiplying said noise power value by a
predetermined coefficient, and detects the first or second
available value, whichever is the smaller, as the first
threshold value.

10 18. A terminal equipment set forth in either Claim 9,
10, and 11 wherein said calculation section for the second
threshold value detects, as the second threshold value,
the value obtained by multiplying the greatest of all said
correlation values by a predetermined coefficient.

15 19. A terminal equipment set forth in either Claim 9,
10, and 11 wherein said calculation section for the second
threshold value measures the noise power value of the
received signal mentioned above and detects, as the second
threshold value, the value obtained by multiplying said
20 noise power value by a predetermined coefficient.

20 20. A terminal equipment set forth in either Claim 9,
10, and 11 wherein said calculation section for the second
threshold value measures, as the first available value,
the value obtained by multiplying the greatest of all said
25 correlation values by a predetermined coefficient, and the

noise power value of the received signal mentioned above,
then calculates, as the second available value, the value
obtained by multiplying said noise power value by a
predetermined coefficient, and detects said first or
5 second available value, whichever is the greater, as the
second threshold value.

21. A terminal equipment set forth in either Claim 9,
10, and 11, wherein said calculation section for the
second threshold value measures, as the first available
10 value, the value obtained by multiplying the greatest of
all said correlation values by a predetermined coefficient,
and the noise power value of the received signal mentioned
above, then calculates, as the second available value, the
value obtained by multiplying said noise power value by
15 a predetermined coefficient, and detects said first or
second available value, whichever is the smaller, as the
second threshold value.